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SMART RECIPE-AN INNOVATIVE WAY TO COOK

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Abstract: *We demonstrate a cooking recipe recommendation system, which runs on either a consumer smart phone or a computer through an application. Recently, coking recipe sites have become popular. Some people who cook, use such sites to obtain information on cooking recipes. Since, these sites are accessible from mobile phones, tablets, pads, and computers at our beck and call. However, to use these sites a user has to input some keywords or select menu items to indicate their preferences on cooking items. This may prevent the user from referring to cooking recipe sites. The proposed system carries out level checking of the ingredients available with the user in a real-time way, and recommends cooking recipes related to the available food ingredients and their quantities. The user can obtain recommendations of various recipes that can be cooked with the available ingredients almost instantly. The objective of the proposed system is to assist people who cook to decide a cooking recipe in restaurants or kitchens. This system involves the use of containers which will contain the ingredients, with the use of level sensors to depict the exact quantity of the given ingredient. The data and the recipes will be stored over cloud for fast access and quick recommendations.*

Introduction:

The Internet of Things (IoT) is a recent communication paradigm that envisions a near future, in which the objects of everyday life will be equipped with microcontrollers, transceivers for digital communication, and suitable protocol stacks that will make them able to communicate with one another and with the users, becoming an integral part of the Internet. The IoT concept, hence, aims at making the Internet even more immersive and pervasive. Furthermore, by enabling easy access and interaction with a wide variety of devices such as, for instance, home appliances, surveillance cameras, monitoring sensors, actuators, displays, vehicles, and so on, the IoT will foster the development of a number of applications that make use of the potentially enormous amount and variety of data generated by such objects to provide new services to citizens, companies, and public administrations.

This paradigm indeed find application in domains, such as home automation and security, thus realizing the so-called Smart Home concept. Although there is not yet a formal and widely accepted definition of Smart Home, the final aim is to make a better use of the resources, increasing the quality of the services offered to the devices, while reducing the operational costs of the devices. This objective can be pursued by the deployment of an urban IoT, i.e., a communication infrastructure that provides unified, simple, and economical access to a plethora of the devices unleashing potential synergies and increasing transparency to the user. An urban IoT, indeed, may bring a number of benefits in the management and optimization of traditional applications, such as automatic control of tap, lighting, surveillance.

The objective of this paper is to discuss a general reference framework for the design of an urban IoT. To measure the quantity of ingredients required for cooking appropriately. To overcome the problem mainly faced on a daily basis on what food items can be made with available ingredients in the available quantity. Reviewing the available applications made to serve the purpose similar to our goal.

Related Work:

1. “A survey on Intelligent Refrigerator using Artificial Intelligence.”

Authors: Sandhiya V, Siddique Ibrahim S.P, Kirubakaran R

In this paper, they determined the age of the items stored in the refrigerator from the time they are bought. Their system notified the user about old products via SMS. In this paper they have presented the Smart Kitchen, an instrumented environment to automatically capture, share and exploit semantically annotated experiences. They have described their hardware and software infrastructure, and presented a first prototype application, the Semantic Cookbook.

2. “The semantic cookbook sharing cooking experiences in the smart kitchen” .

Authors: Michael Scchneider

In this paper they proposed a smart kitchen, instrumented environment to automatically capture, share and exploit semantically annotated cooking experience.

3. “MiruRecipe: A mobile cooking recipe recommendation system with food ingredient recognition”

Authors: Yashiyukti Kawano, Takanori Sata, Takauma Maruyama, Keiji Yanai

In this paper, made a system that carries out object recognition on food ingredients and recommends cooking recipes related to the recognized food ingredients. In this demo, we demonstrate a cooking recipe recommendation system which runs on a consumer smartphone. The system proposed in this paper carries out object recognition on food ingredients in a real-time way, and recommends cooking recipes related to the recognized food ingredients. By only pointing a built-in camera on a mobile device to food ingredients, the user can obtain a recipe list instantly. The objective of the proposed system in this paper is to assist people who cook to decide a cooking recipe at grocery stores or at a kitchen.

4. "Recipe Recommendation considering the flavour of regional cuisine."

Authors: Xuehui Mao, Shizhong Yuan, Weimen Xu

In this Paper, they proposed a model for a multi-sensory food recommendation, taking into account both taste and aesthetic of food. Paper proposes a method to recommend recipes for considering user's schedule and the balance of nourishment.

Algorithm:

Apriori is a seminal algorithm proposed by R. Agarwal and R. Srikant in 1994 for mining frequent item set for Boolean Association rules. The name of the algorithm is based on the fact that the algorithm uses prior knowledge of frequent item set properties, as we shall see following. It employs an iterative approach known as level-wise search, where k-item set are used to explore (k+1). First the set of frequent 1-itemsets is found by scanning the database to accumulate the count for each item, and collecting those items that satisfy minimum support. The resulting set is denoted as L1. Next, L1 is used to find L2, the set of frequent 2-itemsets, which is used to find L3, and soon, until no more frequent k-item set can be found. The finding of each Lk requires one full scan of the database.

A two-step process is followed, consisting of join and prune action:

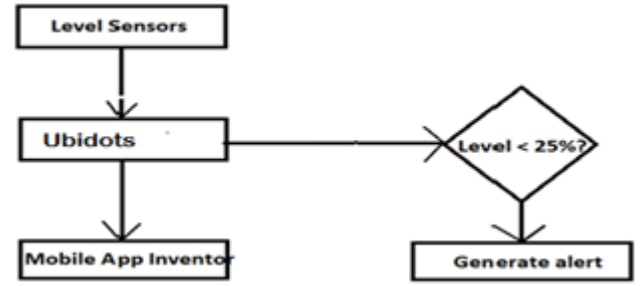
1. The join step:

To find Lk, a set of candidates' k-item set is generated by joining Lk-1 with itself. This set of candidates is denoted Ck. By convention, Apriori assumes that items within a transaction or item set are sorted in lexicographic order. For the (k-1)- item set li, this means that the items are sorted such that li[1]<li[2]<…<li[k-1]. The join, Lk-1 on Lk-1 is performed, where the members o Lk-1 are joinable if their first (k-2) items are in common.

2. The prune step:

Ck is a super set of Lk, that is, its members may or may not be frequent, but all of the frequent k-item set are included in Ck. A scan of the database to determine the count of each candidate in Ck would result in the determination of Lk. Ck, however, can be huge, and so this could involve heavy computation.

The following is the diagram for system architecture. Microcontroller AT89S52 is the main component for the architecture. The devices are connected to the microcontroller and depending upon on the functionality they are connected to the relay or to the motor driver.



System Architecture

Module 1: Level Sensors used to sense quantity of ingredients in the containers. We fit level sensors on the container caps which help in sensing the levels of available ingredients.

Module 2: The levels are constantly updated on the cloud – Ubidots. From the available ingredients, a list of recipes is generated which the user can cook.

Module 3:_Mobile app Inventor is used to create the Android application which the user uses to select a list of recipes.

Conclusion:

Our project aims to minimize time wastage of working people after a long day at work. It will keep a track of the available ingredients in the kitchen with the help of sensors and store the data on the cloud. This cloud data will be analyzed for available recipes that the user can make. This reduces the users time wasted rummaging through cupboards.

References:

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